Date: Thu, 16 Dec 93 04:30:37 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #134
To: Ham-Homebrew

Ham-Homebrew Digest  Thu, 16 Dec 93  Volume 93 : Issue 134

Today's Topics:



Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".



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Date: 14 Dec 1993 17:12:46 GMT
From: sdd.hp.com!math.ohio-state.edu!howland.reston.ans.net!agate!msuinfo!arctic2!
cravitma@network.ucsd.edu
Subject: Feedthrough Capacitors
To: ham-homebrew@ucsd.edu

I have decided to try to build one of the 144 MHz amplifiers from the
ARRL handbook, and came across a part which I don't think I ever saw
before in my limited electronics background. Can someone please tell
me what a feedthrough capacitor is, and why it would be used instead
of a regular capacitor?

Thanks very much.

/Matthew (Still waiting for my ticket, 5 weeks and counting)

--

Matthew Cravit                    | All opinions expressed here are
Michigan State University          | my own. I don't speak for Michigan
East Lansing, MI 48825             | State, and they don't speak for me
E-Mail: cravitma@cps.msu.edu       | (thank goodness).

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Date: 14 Dec 1993 10:56:30 -0600
From: sdd.hp.com!elroy.jpl.nasa.gov!usc!howland.reston.ans.net!torn!nott!bnrgate!
corpgate!crchh327.bnr.ca!debaker@network.ucsd.edu
Subject: Help! 9600 baud info needed!
To: ham-homebrew@ucsd.edu

I am trying to get a radio modified for 9600 operation, but so
far I haven't been able to get very much information.  I am
using a Kenwood TM-742A, and would like to run it at 9600.  If
anyone (preferably someone with a modified 742) knows how to
do this, please email or post here, or packet mail at
AB5PI@N5LDD.#DFW.TX.USA.NA

Thanks,

| David E. Baker                  Opinions expressed are |
| Callsign: AB5PI                 mine, and they do not  |
| Internet: debaker@bnr.ca        necessarily reflect    |
| IP Addr:  47.122.65.7           the opinions of BNR or |
| Unix ID:  crchh7b0              or Northern Telecom.   |

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Date: 11 Dec 93 21:28:12 GMT
From: olivea!isc-br!tau-ceti!comtch!opus-ovh!bmork@uunet.uu.net
Subject: Minisport Laptop Hacker - Vol 18
To: ham-homebrew@ucsd.edu

MiniSport Laptop Hacker - Vol 18, Dec 1993


>>> ADMIN
Remember, you can get copies on disk of any software or text file I re-
fer to (including the MLHacker series) by sending me a disk and SASE.
I'll put a variety of other MLHacker related goodies on there, too.
MLHacker is available on the KA6ETB Internet HAM-Server.  Send a message
to ham-server@grafex.cupertino.ca.us with the single line of text: HELP
to get access information.  Check the \hamradio\newsletters directory.
If you're comfortable with late-night long distance phone calls, you may
download MLHacker related stuff directly from me at 509-244-9260. Use

the FILES command, and L)og into the \public\computer directory. Standard XMODEM and YMODEM protocols are available. ARO related CD-ROM, Internet e-mail, and Usenet newsgroups are also available from this free service.

>>> POWER SUPPLY

Nothing, I repeat nothing, beats a schematic diagram when fixing electrical equipment. No fancy test equipment can compare. Thank you big time, Brian, for 1) recognizing my reverse engineered attempt (see Vol 17), and 2) sending me the real schematic! Two hours later... I have a dead n-channel enhancement-mode MOSFET ("K612" in case anybody can offer a cross reference). There's a 7V p-p, 500 KHz square wave arriving at the gate. The intent is that the drain pulls current through a switching power supply transformer primary. Wasn't happ'ning. Drain stays at the +V supply voltage. Comparing with another K612 that handles the electroluminescent screen voltages confirms the first one is not working.

Several parts houses couldn't identify the K612 part, so I made a trip to Radio Shack and picked up a 276-2072 IFR510 n-Channel MOSFET. It's about twice as big as the K612, and its specifications are an over-kill, but it's all I had available. It cost just over $2.00. Instead of mounting it as a surface mount on the bottom side of the circuit board, I layed it sideways between some capacitors on the top of the circuit board and ran hookup wire to the bottom side of the board for connections. Everything works fine! A representation of the power supply pinout given in Vol 5 is in order. This time, I know functionality, too.

With the bottom of the computer removed, the motherboard still in place, pin 1 is toward the right and front of the computer, numbered like this:

```
    15 13 11  9  7  5  3  1
    16 14 12 10  8  6  4  2
```

| | |
|---|---|
| 1 | 5 V backup supply #1, 10-300 mA |
| 2 | BACKUP-ON request from computer, TTL levels |
| 3 | Ground (backup power supplies) |
| 4 | 5 V backup supply #2, 10-45 mA |
| 5 | VEE-ON request from computer, TTL levels |
| 6 | -22 V (Vee), 10mA |
| 7 | +10 V, 10 mA |
| 8 | -10 V, 10 mA |
| 9 | EL-ON (LCD screen) request from computer, TTL |
| 10 | Li Battery +V input to power supply (~6.3 V) |
| 11 | Ground (Li battery circuits) |
| 12 | POWER-ON request from computer, TTL levels |

13  Ground (hi current return from pins 15/16)
14  Duplicates Pin 13
15  5 V (Vcc), 0.25-0.6 A)
16  Duplicates Pin 15

A note of caution is in order. The computer will automatically shut down if certain voltages don't come up to specs within a few seconds (this appears as a 2 second blink of the power and numlock LEDs and the screen). Requests from the computer can be deceiving unless you know what you're looking at. For instance, I repeatedly measured Pin 9 at zero volts during my debugging. I thought the computer was erroneously not asking for the screen voltages. In fact, right when I pushed the power button, it came high for a few seconds, and then shut back off. It !was! working ok. Pin 12, on the other hand, went high to 5+ volts and then dropped back to 4.7 volts as the main 5 V supplies were shut down. This pin kept the request (4.7 volts is TTL high) active, and only dropped back to zero when I pressed the power switch once again, telling the computer to shut "off". Realize if there are good NiCads, good Li batteries, or the external charger is plugged in, this computer never really shuts totally off.

There are three main sections to the power supply. The first handles all the 5 Volt supplies. Both batteries are brought in to this section and the normal computer supply and the backup voltages are provided from this circuitry. If pins 1, 4, 15, or 16 are bad at the power supply header, this section is malfunctioning.

The second section is where my trouble occurred. An integrated circuit regulator provides oscillation signals for the switching converter and appropriate voltage feedback control. A three-tapped transformer followed by diode rectification provides +10v, -10v and -22v. If pins 6, 7, or 8 are not at correct voltages, suspect problems in this area.

The last section is associated with the electroluminescent screen voltages, and has its own 6-pin header. To see it, open up your Minisport using the directions in MLH Vol 5 and find the 6-pin jumper going from the power supply board into the display pivot joint. Only 4 wires are used. One handles ground. Two carry current to/from the brightness control, and one is the high voltage drive for the display. Specifically:

6  50-150 VAC p-p, nominally 138 VAC
5  n/c
4  GND
3  n/c
2  return from 20 Kohm brightness control
1  diode rectified 10 VDC going to brightness control

If pins 1 or 6 !of the screen connector! are at incorrect voltages, suspect problems here. Incidentally, Pin 9 of the motherboard power supply connector (see MLH Vol 5 and Vol 17) is a TTL level request from the computer to turn the electroluminescent display on. It goes into Pin 14 of the MB3778. The MB3778 oscillator output is buffered through three parallel CMOS gates and toggles the gate of a K612 MOSFET, which in turn pulls current through a transformer. Subsequently, a high voltage step up transformer (looks like a telephone line isolation transformer) generates the high VAC for the screen.

Packing tape applied on the front and sides of the keyboard worked well to bundle the keyboard to the motherboard as I worked on the assembly. Without this, the keyboard connector ribbons get severely strained as the board is flipped this way then that way.

I am growing to dislike auto-routed circuit boards. The computer logic generates through-the-board vias that terribly confuse a person trying to trace the circuitry. In a lot of cases, casual inspection shows single side alternative routes were available.

>>> BAD ROM DISK
I received a message over Internet from a Minisport user that indicated his ROM disk (C:) has gone dead. He's getting checksum errors on boot-up. Do you have the equipment and willingness to pull your ROM, make a copy and send it on to Ron? I ask this not just for one user, but everyone else this will eventually happen to. The source for original ROMs has dried up, and if we're going to keep Minisports working, it would be good to know who could do this for others.

>>> MEMORY SWAPS
The first MB of memory on a ZL-2 is eight discrete chips soldered on the motherboard. The second MB is a SIPP package. I know from experience the 2nd MB can be unsoldered and swapped into a ZL-1. Thomas asks if the lower and upper MB are interchangeable. Unfortunately, no. However, I would be interested in soldering a standard PC SIPP into my ZL-1 and see if the graft takes. Do you have an unused 1 MB SIPP you'd be willing to let me use?

Please provide feedback: * BBS 1-509-244-9260
* AX.25 KA9SNF@wb7nnf.#spokn.wa.usa
* Internet bmork@opus-ovh.spk.wa.us
73, Brian * 6006-B Eaker, Fairchild, WA 99011

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Brian Mork Internet bmork@opus-ovh.spk.wa.us (BBS 509-244-9260)
. . . .. Amateur Radio (AX.25) ka9snf@wb7nnf.#spokn.wa.usa
... . . USMail 6006-B Eaker, Fairchild, WA 99011

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Date: Mon, 13 Dec 1993 20:13:56 GMT
From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!
sol.ctr.columbia.edu!news.kei.com!ssd.intel.com!rlt@network.ucsd.edu
Subject: PIN diode question
To: ham-homebrew@ucsd.edu

Dear PIN diode hotshots:

I am considering using PIN diodes to switch between bandpass
networks in a project.  However, I read in Hewlett Packard
Application note 922 about the low frequency limit at which
these devices can be used. It mentions that at frequencies
well below fc= 1/(2*pi*tau) that a PIN diode acts like an
ordinary PN diode.  At frequencies about 10*fc, the PIN diode
looks like a variable resistor.

My question is: does this restriction apply only to
applications where the diode is used in the linear resistance
region. My application would operate only in the fully "on"
or fully "off" (i.e. switch) regions.  Are there any other
"gotchas" for PIN diode usage at 3-30MHz?

Thanks

--
 Roger Traylor
 rlt@ssd.intel.com
 Intel Corporation - Supercomputer Systems Division
 Beaverton, OR 97006

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Date: 14 Dec 93 10:47:18 EST
From: sdd.hp.com!swrinde!cs.utexas.edu!howland.reston.ans.net!news.intercon.com!
psinntp!arrl.org@network.ucsd.edu
Subject: PIN diode question
To: ham-homebrew@ucsd.edu

In rec.radio.amateur.homebrew, rlt@ssd.intel.com (Roger Traylor) writes:
>Dear PIN diode hotshots:
>
>I am considering using PIN diodes to switch between bandpass
>networks in a project.  However, I read in Hewlett Packard
>Application note 922 about the low frequency limit at which
>these devices can be used. It mentions that at frequencies
>well below fc= 1/(2*pi*tau) that a PIN diode acts like an

>ordinary PN diode.  At frequencies about 10*fc, the PIN diode
>looks like a variable resistor.
>
>My question is: does this restriction apply only to
>applications where the diode is used in the linear resistance
>region. My application would operate only in the fully "on"
>or fully "off" (i.e. switch) regions.  Are there any other
>"gotchas" for PIN diode usage at 3-30MHz?

Depending on your application, an ordinary PN diode may have
acceptable distortion characteristics. I've used 1N4148s
as microwave IF switches and not measured any problems.
On the other hand, I'm not sure I'd use them as the input
switches to a general coverage HF receiver.

When calculating when the diode is fully on, you should use
a charge model.  Some people try to use voltage models, which
don't predict predict what current is needed to keep the diode
on.  The current needed is inversely proportional to the
frequency.  Thus, switching VHF is easy, while audio switching
with forward biased diodes is tough.  Actually, I've been told
that the latter has been tried in commercial products--with
poor results.  They apparently have switched over to 4066 type
switches.

With enough current, 1N4007 diodes with work, though the loss
is noticeably higher (2 dB??).  I've also heard that 2nd order
distortion can be a problem even when the third order intercept
is acceptable, but haven't run any measurements on this yet.

The big gotcha is getting the diodes you want.  If you are
patient you can find them inexpensively surplus.  I'm not
even sure the guys with big $$$ can get always get medium
or high power PIN diodes without waiting a few months.

Zack Lau  KH6CP/1

Internet: zlau@arrl.org
  .

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Date: Sat, 11 Dec 1993 21:15:36 GMT
From: news.Hawaii.Edu!uhunix3.uhcc.Hawaii.Edu!jherman@ames.arpa
Subject: Precision resistors question
To: ham-homebrew@ucsd.edu

I have questions concerning the following two precision resistors:

1. Shallcross Akra-ohm wirewound type BX-100-J RB21B 13001F ABS

   Is the resistance 13000 ohms? (1300 * 10^1 is how I interpret 13001)
   What is the tolerance?

2. Resistance Products Company LFB RB15AK 1R669F

   Is the resistance 1.669 ohms?
   What is the tolerance?

I'm posting this for a engineer friend - I've never had reason to work
with these type of resistors.

Thanks so much!

Jeff NH6IL

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Date: Tue, 14 Dec 1993 16:40:35 GMT
From: olivea!news.bu.edu!att-in!cbnewsm!jeffj@uunet.uu.net
Subject: Schematic for PLL VFO?
To: ham-homebrew@ucsd.edu

Does anyone have a schematic for Phase Lock Loop VFO laying around for
20 meters and other bands for that matter? I have been interested in
building a computer controlled transceiver and this looks like a good
way to go. Thanks and 73!

Jeff
--
 Jeff Jones  AB6MB         | Vote out those who voted for the North American
 jeffj@seeker.mystic.com   | Free Trade Agreement!
 Infolinc BBS 510-778-5929 |

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End of Ham-Homebrew Digest V93 #134
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